

Analysis (H114)

1. Why didn't the air temperature change above the ice container?

- *Cold air is dense and does not rise when warmer, less dense air is above it. This was demonstrated with the smoke: the smoke mostly stayed near the bottom of the tube. This shows that the air was not rising. Therefore, the thermometers would not register a change.*

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2. How did the air, visible because of the smoke, move in the Convection Tube with crushed ice?

- *The air did not move much. It mostly remained near the cold ice. When we put the smoke into the tube, it moved towards the ice and stayed there. This happened because the colder air is more dense and sinks below warmer, less dense air.*

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3. What happened to the air inside the Convection Tube with the hot water. Explain why you think this happened.

- *The air moved upward in the container with hot water. This happened because the air was heated by the hot water, making it less dense, and causing it to rise over colder, more dense air.*

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4. Why do you think moisture formed on the inside of the convection tube? How does this relate to cloud formation?

- *The moisture formed because water evaporated into water vapor. Then, it condensed on the cooler surface of the convection tube. Clouds are water vapor that condensed on particles in the air.*

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5. If the earth's surface is colder than the air above it, what will happen to the air? What if the surface is hot and damp?

- *If the surface is cold, warm air above it will lose heat energy to the cold surface and remain close to the ground. If a damp surface is warmer, some water will evaporate and the air above it will be heated. The vapor can condense and form clouds.*

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6. What can happen where two air masses meet?

- *A distinct boundary can form where two air masses meet. Denser, cold air masses may slide under the warmer mass and lift it up. The weather at these boundaries becomes unstable and stormy weather may occur.*

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7. Develop working definitions of the terms “stable air mass” and “unstable air mass.”

- *A stable air mass is a body of air that is relatively cool and remains close to the surface.*
- *An unstable air mass is body of air that is relatively warm and rises.*

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8. When are clouds likely to form?

- *Clouds are likely to form from an unstable air mass (where warm air is rising). The rising air carries the water vapor to cooler altitudes and this can lead to condensation. This would result in the formation of clouds.*